

## **Metrics**

Pearn P. Niiler  
Scripps Institution of Oceanography  
9500 Gilman Drive  
MC 0213  
La Jolla, CA 92093  
Phone: (858) 534-0378 fax: (858) 534-7931 email: [pniiler@ucsd.edu](mailto:pniiler@ucsd.edu)

N00014-01-1-0137

### **LONG TERM GOALS**

The long-term goals of this project are to aid in the development of accurate modeling of upper ocean circulation by using data on circulation observations to test models. These tests, or metrics, will be statistical measures of model and data comparisons. It is believed that having accurate models of upper ocean currents will produce accurate models of sea level and temperature patterns.

### **OBJECTIVES**

Assess the efficacy of several OCGMs to model the surface circulation and Lagrangian particle drift in NAVY important areas. The assessment is to be performed with a series of objective measures or metrics that are used to determine how well current OCGM represent Lagrangian properties of circulation. These metrics will be applied to the following models: 1) POP, HYCOM in the Atlantic; 2) POP, MOM, HYCOM and ROMS in the California Current System; 3) POP, NLOM, POM in the Japan-East Sea. Additionally, metrics will be installed into the operational FNMOC system to assess COAMPS performance in near real time. The investigation will initially focus on testing deep-water circulation patterns with drifter and float data, and expand to include assessments of circulation modeling in the littoral zone using drifter and moored current meter data.

### **APPROACH**

Comprehensive data will be acquired from a variety of sources on the motion of drifters and processed into a uniform format. These data will be corrected for wind slip and bias resulting from drogue loss. OGCM model fields will be acquired from existing model integrations and from NAVY operational centers (NAVOCEANO and FNMOC) for comparison. To facilitate the comparison of the COAMPS model with Lagrangian metrics a real time data port will be established at FNMOC and applets will be written to install operational metrics at COAMPS.

### **WORK COMPLETED**

A complete historical drifter data set from the North Atlantic and Japan-East Sea is on file at SIO. Both have been processed into 1-2day average data and corrected for wind slip and bias resulting from drogue loss has been removed. A summary of the North Atlantic data set has been made and a manuscript entitled: "North Atlantic Ocean Surface Currents", by g. Reverdin, P. Niiler and H. Valdemarsson, has been written from submittal to "*Progress in Oceanography*". Metrics have been

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>30 SEP 2001</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2001 to 00-00-2001</b>	
4. TITLE AND SUBTITLE <b>Metrics</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Scripps Institution of Oceanography,,9500 Gilman Drive,MC 0213,,La Jolla,,CA, 92093</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT <b>The long-term goals of this project are to aid in the development of accurate modeling of upper ocean circulation by using data on circulation observations to test models. These tests, or metrics, will be statistical measures of model and data comparisons. It is believed that having accurate models of upper ocean currents will produce accurate models of sea level and temperature patterns.</b>					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>4</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

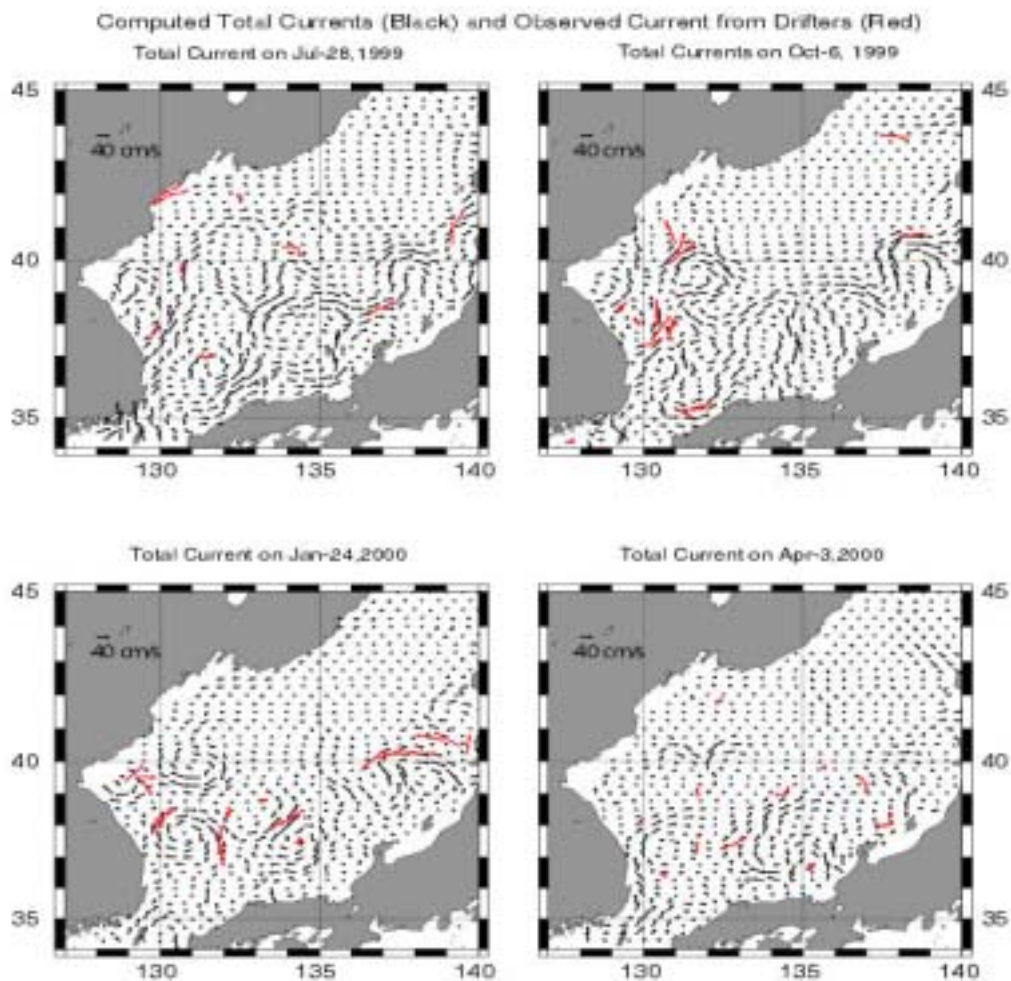
developed and computed for the evaluation of the eddy energy, and its uncertainty, for the North Atlantic.

Access to the POP data set, generated at Los Alamos, has been established and this PI has visited NAVOCEANO in with express purpose of organizing acquisition of their operational model outputs.

Daily maps of drifter (for the mean), satellite (for geostrophic eddies) and wind (for Ekman velocity) produced surface currents has been developed for the JES. This product is being evaluated by drifter observations.

## RESULTS

Comparison of daily maps of currents with drifter observations in the Japan East Sea is included.



**Figure 1. Computed total currents (black) and three one-day averages of observed current from drifters (red). One plot is shown for each season. Dates shown were chosen based on the availability of drifter observations from eight or more drifters.**

**[Four plots of Calculated current versus drifter observations in the Japan East Sea show the agreement between computed currents and observed currents.]**

## **IMPACT/APPLICATIONS**

Maps of surface currents in the JES can be produced in near real time using techniques developed in this research activity.

## **TRANSITIONS**

None.

## **RELATED PROJECTS**

NOAA/OGP funded “Global Drifter Program”

## **REFERENCES**

None

## **PUBLICATIONS**

None

## **PATENTS**

None